

Fuels Workshop on Regulatory and Non-Regulatory Fuels Activities for 2006

June 16, 2006

California Environmental Protection Agency



Air Resources Board

Agenda

- ➡ Introductions and Schedule
- ➡ Diesel
 - Low-Sulfur Implementation
- ➡ Alternative Fuels
 - E85 Demonstration Program – Status Report
 - Suggested Biodiesel Policy

Agenda (Continued)

Gasoline

– California Predictive Model

- Statistical Subgroup
- CO
- Reactivity
- Emissions Inventory
- Permeation

Presentations by Others

Open Discussions

Closing Remarks

Future 2006 Workshops

- ➡ June 30 9:00-12:30 MLD Conference Rooms
 - No webcast for this workshop; conference call arranged
- ➡ July 10 1:30-5:00 Byron Sher Auditorium
- ➡ July 24 1:30-5:00 Byron Sher Auditorium
- ➡ Aug. 11 9:00-12:30 Byron Sher Auditorium
 - These workshops will be webcast; conf. call will be arranged
- ➡ Aug. 25 9:00-12:30 Location Pending
 - Webcasting availability uncertain; conf. call will be arranged

Discussion Topic: Diesel

Implementation of Low-Sulfur Diesel Fuel Regulations

- ➡ Low-Sulfur regulation approved by Board in 2003
- ➡ Implemented in 2004
- ➡ Requires 15 ppmw sulfur limit on California motor vehicle diesel fuel
 - June 1, 2006 – Refinery
 - 45 days later – Terminals
 - 45 days later – Retail Outlets

Implementation of Low-Sulfur Diesel Fuel Regulations

- ➡ ARB staff, in conjunction with the CEC, has surveyed the industry regarding the implementation
- ➡ So far, all California refiners and pipeline operators appear to be on schedule and are expected to meet the September 1, 2006 limit of 15 ppmw

Discussion Topic: Alternative Fuels

E85 Demonstration Program

- ➡ AB 1007 requires the development of recommendations for a state plan to increase the use of alternative transportation fuels.
 - Assigns lead responsibility for developing the recommendations to the California Energy Commission in consultation with the Air Resources Board
 - Requires the plan to be developed and adopted not later than June 30, 2007.

E85 Demonstration Program

- ➡ State entered into agreement with GM, Chevron (CTV), and Pacific Ethanol to learn more about consumer awareness and acceptance of E85 as a motor vehicle fuel.
- ➡ FFVs, about 50, in CalTrans fleet will use E85 at various locations for about 1 year.
 - Oakland and Marysville
- ➡ Vehicles delivered
- ➡ Evaluate need to update specifications

SUGGESTED ARB BIODIESEL POLICY SUMMARY

Suggested ARB Policy would:

- Consider B20 and below as California diesel fuel
- Allow use with verified technologies
- Not address potential NOx increase
- Not address higher blends of biodiesel

SUGGESTED ARB BIODIESEL POLICY

- ➡ Biodiesel blends can be used in on- and off-road diesel vehicles and engines under the following conditions:
 - Biodiesel portion of the blend meets the ASTM 6751 (15 ppm sulfur)
 - Diesel fuel portion of the blend complies with CARB diesel fuel regulations
 - Resulting mix contains no more than 20% biodiesel by volume

SUGGESTED ARB BIODIESEL POLICY (Contd)

- ➡ Vehicles using CARB verified retrofit devices can use biodiesel blends up to 20%
 - Verification based on CARB diesel

- ➡ Users of biodiesel blends should determine if use of the desired biodiesel blend will affect their emission control or engine warranty
 - Advised to avoid use of fuel that would negate a warranty

SUGGESTED ARB BIODIESEL POLICY (Contd)

- ✎ Biodiesel blends generally reduce diesel PM and organic compounds; NOx emissions may increase
 - Effects increase as the percent of biodiesel in the fuel increases
 - Blends of no more than B20 could expand use of an alternative, renewable fuel while preserving vehicle emission performance
 - Widespread use of biodiesel may require ARB to set specifications to ensure CARB diesel emissions benefits

SUGGESTED ARB BIODIESEL POLICY (Contd)

- ➡ B100 (100% biodiesel) or blends ≥ 50 percent are currently exempt from ARB's diesel regulations
- ➡ Biodiesel blends > 20 percent and < 50 percent biodiesel are not prohibited by ARB regulations; but are not recommended at this time.

Biodiesel

- ➡ Initiate biodiesel research to study the impacts of biodiesel use in California
 - Emissions impact
 - Lifecycle assessment
- ➡ Governor's EO S-06-06 sets California biofuels production targets
 - 20 percent 2010
 - 40 percent 2020
 - 75 percent 2050

Discussion Topic: Gasoline

Predictive Model

- ➡ Committed to the Board to review need for update about every 5 years – last updated 1999
- ➡ Issues
 - Permeation
 - Carbon Monoxide
 - New Data
 - Reactivity
 - Emissions Inventory Model – EMFAC
- ➡ Currently slated to go to the Board in October of 2006

Predictive Model - Hydrocarbons

☞ Four Parts

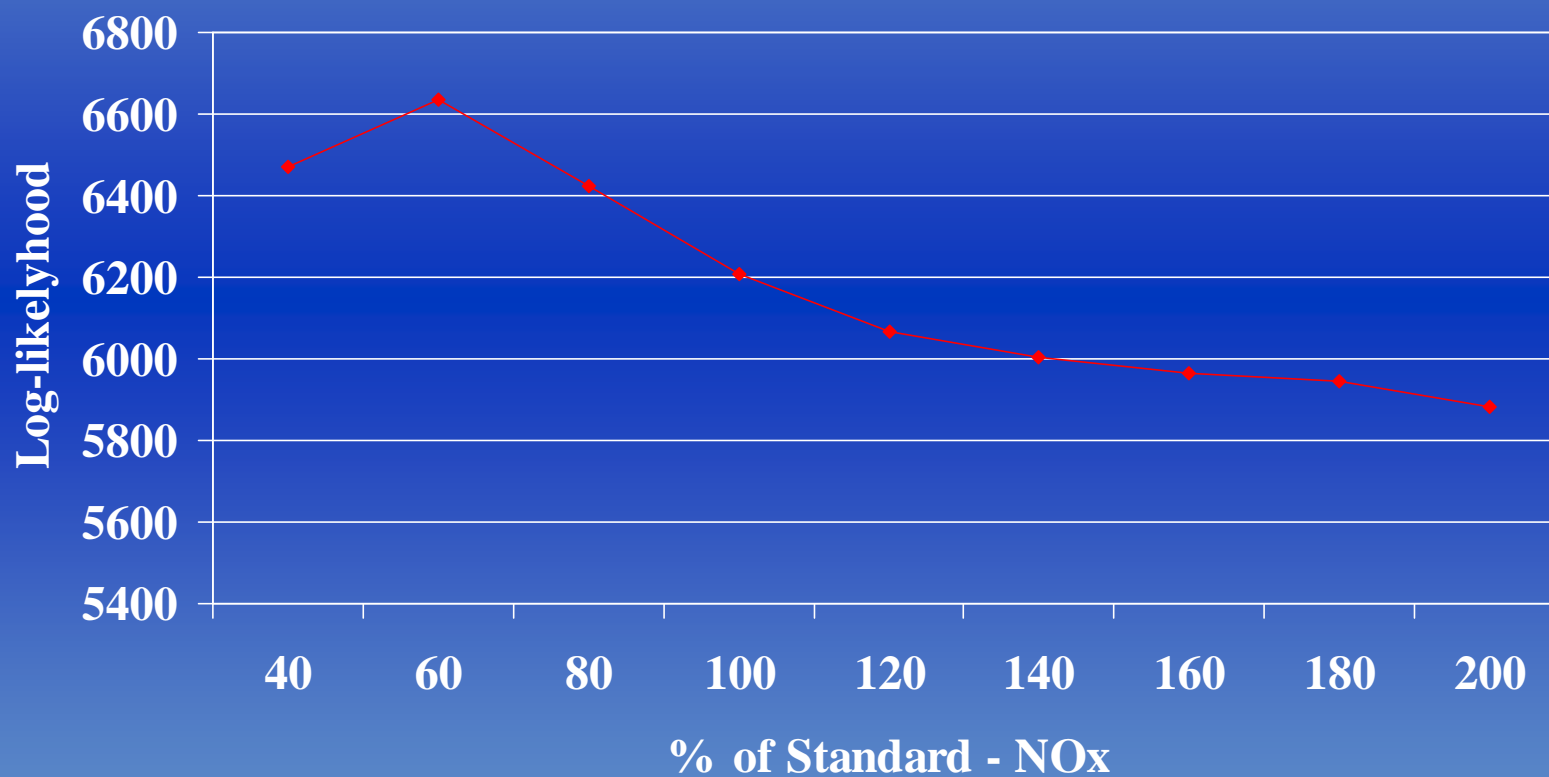
- Exhaust HC% * IWF * RF +
- Evap HC% * IWF * RF +
- CO% * IWF * RF +
- Permeation% * IWF * RF

☞ Evap HC - Hot Soak, Diurnal, Resting Loss, and Running Loss

Statistical Subgroup

- ➡ Weekly conference calls
- ➡ Working on:
 - Transformations - Log Transform too severe?
 - Repeat Tests vs Random Tests
 - Partitioning of the Tech 4 Dataset
 - Stepwise procedure
- ➡ Will refine concepts and consult where differences continue

Partitioning of Tech 4 Dataset - NO_x Percent of 1 gram/mile Average



Dividing the Dataset

- ➡ Must consult with automobile manufacturers and mobile source divisions about why best fit is about .5 to .6 of standard
- ➡ Vehicle responses versus sparse data effect?
- ➡ Can not find a motor vehicle emissions control technology reason for dividing the dataset

Carbon Monoxide

2003 Update to MIR Values

- ➡ 23 existing VOCs for which new MIR values differed by 5% or greater
- ➡ 102 new VOCs added to the list
- ➡ CRC Project E-65, developed permeation species profiles for MTBE, Ethanol, and, Non-Oxy Fuel for each of 10 Vehicles in test program
- ➡ Using the new MIR values for permeation provided a maximum of ~ 0.2% change in composite MIR for any given vehicle/fuel combination

Permeation Test Program

- ➡ In 2002, the CRC and ARB co-funded permeation study
- ➡ Results:
 - Ethanol fuel higher than MTBE on all vehicles and higher than non-oxy on almost all vehicles
 - 65% or 1.4 grams/day more than MTBE gasoline
 - 45% or 1.1 grams/day more than non-oxygenated gasoline
- ➡ ARB Emissions Inventory working on using data to estimate emissions

Permeation - What's Next

- ➡ The CRC is proceeding with a second stage of the test program
- ➡ Two additional vehicles: LEV II and PZEV
- ➡ Two additional fuels: 10% ethanol and a higher aromatics fuel
- ➡ Interim Final Report available soon?

Emissions Inventory

Presentations by Others

Open Discussions

Closing Remarks